EXPLANATION OF PLATE IV.

Sargassum Henslowii.

Fig. 1. A leaf from the main stem.
— 2. Ditto from the branches.
— 3. Vesicles.
— 4. One of the little tufted ramuli composed of leaves and receptacles.
— 5. Ditto with vesicles. 4 and 5 magnified.

Sargassum Vachellianum.

Fig. 1. One of the ultimate ramuli.
— 2. A vesicle from one of the main branches.
— 3. Vesicles from the racemes of fructification.
— 4. Leaf.
— 5. Part of a raceme. 4 and 5 magnified.

Sargassum ornatum.

Fig. 1. Part of a branch.
— 2. Leaf from the stem.
— 3. Vesicles.
— 4. Raceme of fructification ; the last magnified.

XXIV.—*Remarks on the Identity of the Epoch of the Coal-beds and Palæozoic Rocks of New South Wales.* By the Rev. W. B. Clarke, M.A., F.G.S. &c.

Having read with great attention and interest the observations of Mr. M'Coy "On the Fossil Botany and Zoology of the Rocks associated with the Coal of Australia," published in the 'Annals of Natural History' for September, October and November 1847, I feel impelled to offer a few remarks which I trust will be admitted into the pages of that Journal.

The specimens which have undergone so close an inquisition on the part of Mr. M'Coy were, as he has already stated, collected by me in various parts of the colony of New South Wales, on the eastern or sea-board side of the Cordillera or Dividing Ranges of the Blue Mountains, with the exception of the plants from Mudgee and Guntawang, which localities are on the summit of the western plateaux. By what accident I know not, but it is certain a considerable part of the fossils which I sent to Professor Sedgwick have been lost, for the missing cask which should have accompanied those received by him cannot be heard of. Had that cask reached its destination, it would have been found to contain numerous species both of plants and animals, including Testacea, Zoophytes, Crinoids, &c., which would more fully have confirmed, in some respects, Mr. M'Coy's conclusions. Amongst them were various species from the neighbourhood of Musselbrook, Wollon Hills, Mount Wingan, and the country

between Awaaba and Warrawolong; together with plants and zoological remains from the Wianamatta trough, in geological position higher than those recently examined. These species I trust to be able, at a future opportunity, to submit to inspection so soon as my engagements allow me to re-explore the different districts.

To Mr. M'Coy I am very greatly indebted for the patience, skill, and carefulness with which he has determined so many species in my collection. He has completely confirmed the conclusion at which I had long arrived, and which so late as June 1847 I expressed, in perfect ignorance of Mr. M'Coy's labours and conclusions, in my evidence before a Select Committee of the Legislative Council of New South Wales, inquiring into the existence and extent of coal in this territory. My words were these, speaking of the beds of the Australian coal-formation: "I do not mean to imply that they are on the exact horizon of the greater part of the carboniferous formation of Europe, for I believe them to be as old as, if not older than, the lowest beds of that formation." (Coal Inquiry, 7, June 3, 1847.)

Now in this remark I included not only those beds from which all the fossils examined by Mr. M'Coy were derived, but others much lower down in the order of deposits. Mr. M'Coy has arrived, however, at a conclusion which it is the express object of this notice to meet. He says: "With such evidence as I have mentioned, I do not think it improbable that a *wide geological interval occurred between the consolidation of the fossiliferous beds which underlie the coal and the deposition of the coal-measures themselves*; that there is no real connexion between them, but that *they belong to widely different geological systems, the former referable to the base of the carboniferous system, the latter to the oolitic*, and *neither showing the slightest tendency to a confusion of type*." (Annals, xx. p. 311.)

I have frequently expressed in letters to Professor Sedgwick my belief, that there is no break whatever between these various beds, but that the fossiliferous rocks are interpolated by the coal-beds containing the peculiar plants described; and Mr. Jukes, who examined with me in 1845 a portion of the Illawarra coast, has expressed the same opinion (Quarterly Journal Geol. Society, vol. iii. p. 244). Count de Strzelecki differs from this opinion; and Mr. Dana of the United States Expedition, with whom I examined the southern coast of Illawarra in 1840, far beyond that seen by Mr. Jukes in 1845, expressed at that time his doubt as to the transition mentioned by the latter gentleman. But Mr. Dana saw in the low cliff at Black Head, in the very midst of the organic remains as described from that locality by Mr. M'Coy, frusta of the identical fossilized wood mentioned by

Mr. Jukes as so extremely abundant not only on the descent of Mount Keera, in the midst of the great sandstone, *above the coal*, but also on the beach at Towrudgi Point to the northward.

Since the first part of Mr. M'Coy's paper reached this country, I have instituted an inquiry into some localities in order to re-examine the facts which I have stated elsewhere. The result is, that at Muree (which is a locality not far from Raymond Terrace) I found the same lumps of rock containing not only the palæozoic fossils described by Mr. M'Coy, but also impressions of stems and leaves of *Glossopteris lineata*; so that no doubt whatever can exist, that at Muree there *is* a distinct "*confusion of type*," or the plants and testacea, and crinoids and zoophytes are of the same age. Again, at Anvil Creek, west of Harpur's Hill, true coal of good quality is overlaid by beds of gray grit, scarcely distinguishable from one of the Mulubimba beds, charged with Spirifers and other fossils described by Mr. M'Coy. On the Page river, a tributary of the Upper Hunter, the same fossils occur over coal, and at Mount Wingan the conglomerate which lies considerably above the coal is filled with Spirifers, &c.

Stems and leaves of ferns occur also in fossiliferous beds on the Allyn, and in various parts of the Hunter River district. At Paramatta casts of shells have been found in quarries at the very top of the great sandstone and between it and the Wianamatta beds, which are on the Illawarra escarpment full 800 feet above the coal. And these Wianamatta beds, at Clarke's Hill and elsewhere in the Cowpasture country, abound with ferns. Near Campbell Town the shales contain fish, as at Paramatta, and a new coral. It is my intention to forward to Europe a new series of specimens, as it is impossible to compare them here from want of collections.

In the meanwhile, I have to solicit of geologists that they will not too hastily admit the vast hiatus supposed between the coal-beds of Australia and the other fossiliferous beds, or refuse to the statements I now put forth their indulgence.

I am inclined to assent to the statement first made respecting the *Pachydomus* bed overlying coal at Spring Hill, Van Diemen's Land, having recently received some specimens of shells identical with some of those described by Mr. M'Coy, from Broadwater on the river Jordan, V.D.L., which fully bear out the evidence from Spring Hill.

My impression is, that our Australian coal-beds interpolate the series which Mr. M'Coy determines to be of a far older epoch; and that the coal is derived from drifted matter, for which latter conclusion there is abundant evidence. I shall be able to produce also some plants from our coal-field, which I feel confident will tend to unite the two disjointed portions of our

series of rocks, and to afford additional testimony to the proof derivable from the rocks at Muree, that the supposed distinction of æra is not justified by actual knowledge of this country. Should my future explorations of the territory with which I am geologically familiar, extending over 15,000 or 16,000 square miles, not confirm my position, I will avow it; but the facts I have already mentioned require explanation, and I can see no other than this.

As the coal occurs always in patches or areas of limited extent, it may be supposed to have been drifted into hollows in the then sea-bottom, and so entangled amidst the fossiliferous beds. And as to the prevailing character of the plants, it is quite possible that formerly plants of oolitic character might grow at an earlier epoch in Australia than in Europe, whilst the oceans in each hemisphere might have a common fauna. It would be strange if the botany of Australia at any period was identical with that of any part of Europe at any one period, but there is nothing extraordinary in believing such a condition of oceanic life.

So long as the fossil wood of the coal-measures, and leaves and stems of *Glossopteris* occur in the same rock-specimens with the *Spirifers, Productæ, Conulariæ,* &c., which I maintain they do, and since Mr. M'Coy has without doubt assigned the true epoch to the latter, I must take the liberty of expressing my belief from what I have seen, and know from actual and careful and repeated examination of a very extensive region during several years, that there is no break in our Australian series of deposits, and that if the palæozoic fossils are of the lowest carboniferous age, so the age of the coal-plants is nearly identical with it, there being only such interval as is necessary to a succession of deposits.

The freshwater limestone containing *Bulimus* and *Helix*, described by Strzelecki (p. 139), in connexion with the variegated sandstone, has in this colony, where it abundantly occurs, no connexion whatever with that sandstone. It is clearly a tertiary or more recent travertine, and I have found it in numerous localities, containing in some places impressions of leaves, casts of branches and seed-vessels of *Casuarinæ,* and in one locality, Stone-quarry Creek, *bones* apparently of kangaroo.

Lastly, I may mention, that I have examined the manner of growth of our *Casuarinæ,* since Mr. M'Coy suggested their proximity to the *Phyllotheca* of the Australian coal-beds, and must confirm the general resemblance pointed out by him. But I have nowhere in the bush seen any species of *Casuarina* which in any manner exhibits the expansion of its leaves in the way exhibited by the Mulubimba plants. There can be no doubt that the branches spring from within the sheaths in all our *Casuarinæ,* but I have never found in many thousand examina-

tions a whorl of leaves more than a few lines in length, and then only at the extremity of the stalks; so that the identity is not complete.

St. Leonard's Parsonage, North Shore, Sydney, April 7, 1848.

PROCEEDINGS OF LEARNED SOCIETIES.

ZOOLOGICAL SOCIETY.

January 25, 1848.—Dr. Gamble in the Chair.

ON A NEW SPECIES OF PARROT. BY G. R. GRAY, ESQ., F.L.S.

I have compared the drawing of a Parrot now living in Lord Derby's collection at Knowsley with all the descriptions and figures of the different known species, but have not succeeded in meeting with one to which it can be referred. I am however somewhat doubtful whether the bird represented belongs to the genus *Platycercus*, or to *Coracopsis*; I have given the preference to the latter, leaving it to those who may have a better opportunity of examining the specimen than I had, while it was in London in the summer of 1847, to decide this question; and I feel that it is even possible that it may prove to be the type of a new form altogether. I propose to characterize it provisionally as

CORACOPSIS? PERSONATA.

Sp. Ch.—Smaragdina; fronte, periophthalmis mandibularumque basi atris; pectore abdomineque medio aurantiacis, hoc saturatiore; remigibus rectricibusque cyaneo-nigris.

The habitat of this fine bird is supposed to be New Guinea. It appears to be about fifteen inches in length.

February 8.—William Yarrell, Esq., Vice-President, in the Chair.

Three communications were made to the Meeting:—

1. DESCRIPTION OF A NEW SPECIES OF GALIDICTIS FROM MADAGASCAR. BY JOHN EDWARD GRAY, ESQ., F.R.S.

Geoffroy St. Hilaire, in the manuscript catalogue of the Mammalia in the Paris collections, notices a specimen from Madagascar which had been collected by M. Sonnerat, which he described in the following manner, under the name of *Mustela striata*: "Supra saturatè fusca; striis quinque longitudinalibus angustis parallelis albis; gastræo pallidè canescente, caudâ basi fuscâ, reliquâ albâ; statura Mustelæ vulgaris."—*Fischer, Syn.* 224.

M. Cuvier in the 'Règne Animal' (ed. 2de. 144) described the same specimen under the name of "La Belette rayée de Madagascar, *Putorius striatus*, Cuvier, de la taille de la belette d'Europe, d'un brun roussâtre avec cinq lignes longitudinales blanchâtres; de dessous et presque toute la queue blanchâtre."